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FOSSIL BIRDS FROM MONGOLIA AND CHINA[1]

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During the Central Asiatic Expeditions of the American Museum of Natural History under Dr. Roy Chapman Andrews, there were obtained several collections of remains of fossil birds that, through the interest of Dr. Walter Granger, have been placed in my hands for study with results of more than usual value. Investigation of this material though seemingly difficult has proved relatively simple when definitely undertaken, particularly because of the little that is known of the fossil avifauna of the area concerned. The rich osteological collections of the U. S. National Museum contain good series of skeletons of eastern palaearctic birds without which these studies would have been impossible. The final results of these investigations add materially to knowledge of the ancient bird life of the area concerned.

The material secured may be divided naturally into two groups, of which the first includes numerous remains from the Eocene with fragmentary material from Oligocene and Miocene deposits. These specimens are all from Inner Mongolia and are made up of heavily fossilized bones that in many cases are very well preserved in spite of their antiquity.

Little has been published on the Tertiary bird life of eastern Asia. Teilhard de Chardin[3] figures without name the lower part of a tibiotarsus of a bird from Tertiary deposits near Saint-Jacques (San-tao-ho) on the plateau of Ordos that may possibly be a form of the genus of crane described in the pages that follow. As *Baluchitherium grangeri* is listed from these same deposits, the beds are supposed to be of Oligocene age. From Oligocene deposits in the red beds of Chiton-gol, Inner Mongolia, the same author (p. 42) mentions fragments of ostrich eggs. Other accounts of fossil birds from the Tertiary horizons of this broad area so far as they have come to my attention refer principally to eggs and bones of the Struthionidae[4] none of which were included in the present collections.

[1]Publications of the Asiatic Expeditions of The American Museum of Natural History. Contribution No. 123.

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[3]1926, Ann. Pal., XV, p. 31, Pl. III, fig. 9.

[4]See Lowe, P. R. 1931, Pal. Sin., Ser. C, VI, fasc. 4, pp. 5–40.

The second group of specimens includes bones obtained from bone pits, known for many years through the operations of Chinese who have mined them commercially, at Yen-Ching-Kou, near Wanhsien, in the province of Szechwan, China. This material includes specimens of Pleistocene age with some that are of uncertain antiquity, though it is probable that all come from Ice Age deposits.

Records of bird remains from Pleistocene deposits in the general area under discussion are somewhat more numerous than those from the Tertiary, though here information is as yet scant, and few species have been definitely reported.[1] The tragopan and the Lady Amherst's pheasant recorded beyond, from Yen-Ching-Kou, seem to be the first reports of these species in fossil deposits. The beds concerned should yield much additional information if further collections can be obtained from them.

The two sets of collections are treated separately in the account that follows, to permit a consistent systematic arrangement and a logical presentation of the species concerned.

Drawings illustrating this report have been made by Sydney Prentice.

I. COLLECTIONS FROM INNER MONGOLIA

Order **FALCONIFORMES**

In 1928 in the Upper Eocene of the Irdin Manha (Ulan Shireh) formation at Chimney Butte, Shara Murun region, Inner Mongolia, with other bird bones, there was obtained a left coracoid (Amer. Mus. 2941) of a large hawk. (Fig. 1.) In general form and proportions this specimen resembles species of the subfamily Buteoninae in the family Accipitridae so far as its characters may be ascertained. The bone has been somewhat crushed and distorted, so that, while it appears in fair condition, on careful examination there is doubt as to a good proportion of its characters. This uncertainty and the fact that the coracoid at its best ordinarily shows few differences in related species other than that of size, have made this fossil of such doubtful status that it has been deemed best not to name it except to indicate that it belongs in the Falconiformes.

As one of its principal peculiarities the scapular facet is more deeply impressed than in any modern species examined, the depression being nearly circular, with its boundary complete and not broken. The internal distal angle seems to have had a considerable projection. The bone was pneumatic and has a well marked foramen on the inner side of the shaft.

[1]See Bate, Dorothea M. A., 1931, Pal. Sin., Ser. C, VI, fasc. 4, pp. 41–47.

It is believed to be representative of a family group ancestral to the Accipitridae, an assumption that only further material can verify.

Order **GRUIFORMES**

Superfamily **GRUOIDEA**

Family **EOGRUIDAE**, nov.

Related to *Gruidae* but with lateral trochlea of metatarsus reduced and simplified in form, the leg and foot being modified for running; legs long and slender; other characters indicated in the description of genus and species following.

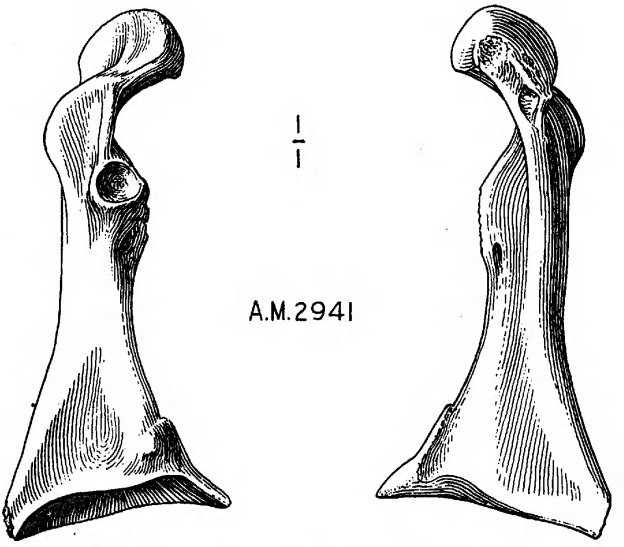

Fig. 1. Coracoid of a hawk from the Irdin Manha beds, Upper Eocene, of Mongolia. Amer. Mus. No. 2941. Natural size.

Eogrus aeola, gen. et sp. nov.

TYPE:—Amer. Mus. 2936 (Field No. 636), a right metatarsus nearly complete. From the Irdin Manha (Ulan Shireh) formation, Upper Eocene, of Chimney Butte, Shara Murun region, Inner Mongolia. Collected in 1928 by Dr. Walter Granger.

CHARACTERS:—In proportions of leg generally similar to *Grus canadensis* (Linnaeus)[1] but differing decidedly in contour and form; metatarsus with middle trochlea elongated; inner and outer trochlea reduced, with wing of inner trochlea little developed; distal foramen elevated in relative position on shaft, relatively small in size; a ridge extending up posterior surface of shaft to merge with talon; head of bone more gracefully formed; tibiotarsus having the intercondylar fossa much

[1]1758, *Ardea canadensis* Linnaeus, Syst. Nat., ed. 10, I, p. 141.

narrower, with walls rising more abruptly; supratendinal bridge decidedly narrow; internal ligamental prominence restricted, less elevated; groove for peroneus profundus less developed. (Figs. 2–5.)

DESCRIPTION OF TYPE.—Head (Fig. 2) abruptly expanded on shaft, the cotyla of the proximal articular surface distinctly cupped, with sharp-edged margins, the external one lower than the internal, the two separated by a high triangular intercotylar protuberance; talon projecting posteriorly as an irregular block, the inner face plane, forming a right

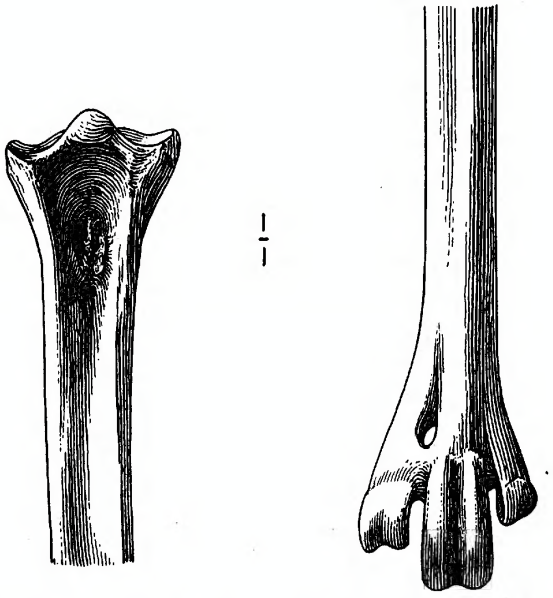

Fig. 2. *Eogrus aeola*, gen. et. sp. nov. Anterior view of proximal (Am. Mus. No. 2936, type) and distal (Am. Mus. No. 2937) portions of metatarsus. Natural size.

angle with the cross axis of the head, outer face irregularly rounded; perforated by a large foramen, and merging gradually distally with the shaft; a pronounced excavation below head on anterior face in which there are the usual two foramina; tibialis anticus tubercle and proximal ligamental attachment at same level; shaft slender, shallowly concave on anterior face, the channel less marked below the middle but persisting faintly until it merges with the depression in which the distal foramen is located; outer face of shaft forming a right angle with the anterior surface, slightly concave for proximal half; posterior face raised in a ridge that is slightly grooved for two-thirds of its length below the point

where the talon merges with the shaft; inner face of shaft rounded toward the ridge mentioned; distal end of shaft broadened and flattened transversely with a well marked distal foramen; first toe apparently absent; inner trochlea, relatively reduced in size, attached to the shaft by a narrow base, flattened from side to side, with the outer and inner faces somewhat excavated; outer margin slightly produced posteriorly, and posterior face slightly grooved; projecting distally for slightly more than one third of the length of the middle trochlea; middle trochlea relatively large and heavy, compressed laterally but thickened posteriorly; internal and external faces considerably excavated; a heavily marked groove around articular surface; trochlea somewhat narrowed and cut away on proximal posterior portion; external trochlea (distorted from its proper position in the type by pressure) relatively reduced in size though somewhat larger than the internal, reaching slightly beyond the middle of the central trochlea, and extended somewhat posteriorly; narrow and compressed with the inner face excavated; external margin slightly produced, with a slightly indicated groove around articular surface. Bone heavily fossilized, very pale brownish white in color.

MEASUREMENTS.—Type, total length 221 mm.; transverse breadth of head 21.7 mm.; least transverse diameter of shaft 8.5 mm.; transverse diameter through trochlea (approximate) 20.2 mm.; transverse diameter of middle trochlea 8.8 mm.; antero-posterior diameter of middle trochlea 12.5 mm.; transverse diameter of inner trochlea 4.7 mm.; transverse breadth of outer trochlea 6.2 mm.

REMARKS.—The present species is far more abundantly represented than is usual with fossil birds, though with one exception all of the material identified comes from the tibiotarsus or metatarsus.

From the type locality there were obtained six metatarsi in addition to the type, three of these being quite complete. One of these (Amer. Mus. 2937) has been used in illustrating the distal end of the metatarsus (Figs. 2 and 3), as the type has the external trochlea somewhat distorted.

These specimens are generally similar in conformation but vary somewhat in dimension as the following measurements will indicate: total length 235, 244 mm.; transverse diameter of head 22.7, 24.6 mm.; least transverse diameter of shaft 8.2, 8.6, 9.2, 9.5 mm.; transverse diameter through trochlea 20.7, 21.6, 22.1, 24.2, 24.2 mm.; transverse diameter of middle trochlea 8.6, 8.7, 9.0, 9.7 mm.; transverse diameter of

inner trochlea 4.9, 5.0, 5.3, 5.4 mm.; transverse diameter of outer trochlea 5.9, 6.0, 6.3, 6.4 mm.

In the same general locality as the type (i.e. Chimney Butte, Shara Murun region) there were obtained eight more or less complete tibiotarsi that are identified as *Eogrus aeola*. One of these is so badly crushed as to be barely recognizable, while the others have the distal portion complete with the head and upper end of the shaft broken and destroyed.

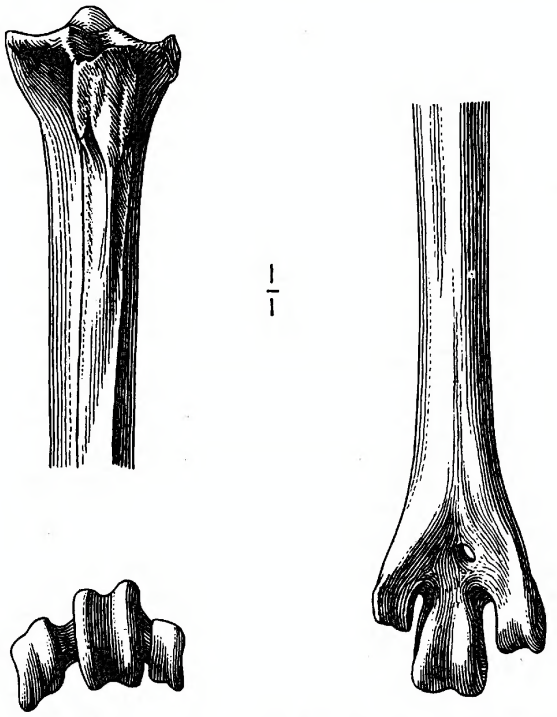

Fig. 3. *Eogrus aeola*, gen. et sp. nov. Posterior view of proximal portion (Am. Mus. No. 2936, type) and posterior and end views of distal portion (Am. Mus. No. 2937) of metatarsus. Natural size.

One is merely a fragment of the lower end. The characters of the lower part of the bone (drawn from No. 2939) are shown in the accompanying figures (Figs. 4, 5). No attempt has been made to restore the head from the fragmentary material available.

In general these tibiotarsi while strong are slender and elongated. Following is a description taken from specimen No. 2939: outer face of external condyle with anterior and posterior margins rounded, much flattened distally, projecting equally to the front and back of the median

line; external margin slightly raised to bound the faintly depressed central area; internal condyle with anterior portion flattened and compressed, projecting strongly forward; posterior section much wider with a sharp margin; lower edge flattened and slightly indented; a faintly indicated tubercle at level of anterior margin of shaft; rotular channel in

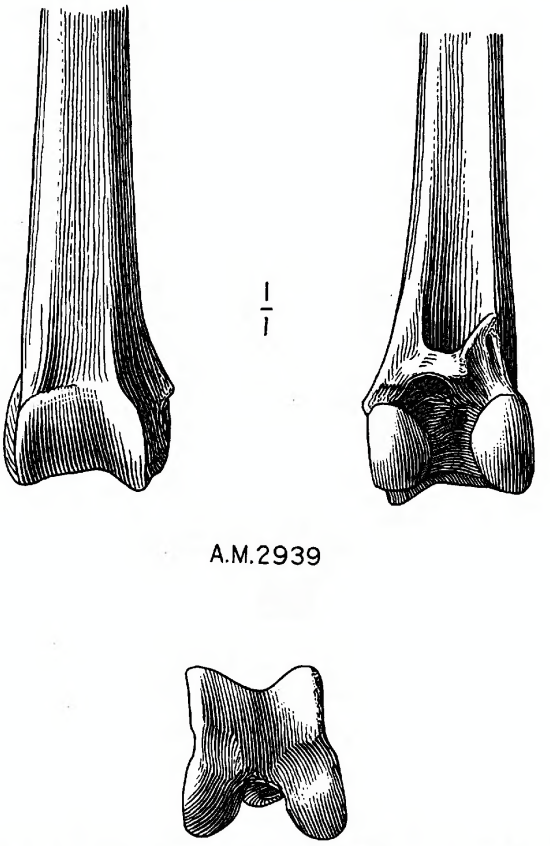

Fig. 4. *Eogrus aeola*, gen. et sp. nov., Amer. Mus. No. 2939. Anterior, posterior and distal views of tibio-tarsus. Natural size.

front relatively narrow and deep, marked by abrupt walls on either side which form right angles with the bottom; articular surface a broad, shallow groove, with distal surface irregularly impressed on either side by slight concavities; tendinal bridge relatively narrow, with a strong, raised tubercle external to it; shaft flattened in front and rounded behind.

Two other specimens show strongly developed crests and a heavy head but are so crushed that details are not certain. The peroneal ridge is well marked.

Following are pertinent measurements from these tibiotarsi: approximate length 260, 265 mm.; least transverse diameter of shaft 10.3, 10.5, 10.6, 10.6 mm.; transverse diameter through trochlea 19.1, 20.0, 20.1, 20.2, 20.7 mm.; antero-posterior diameter of outer condyle 19.1, 20.0, 20.1, 20.2, 20.5, 20.7 mm.; of inner condyle 19.7, 20.4, 20.9, 21.4 mm.

The distal ends of three additional tibiotarsi (Cat. No. 6600) collected in 1923 are labeled as from Irdin Manha beds without further

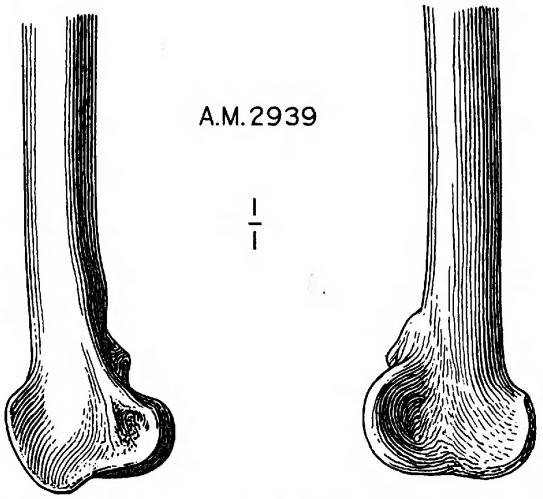

Fig. 5. *Eogrus aeola*, gen. et sp. nov., Amer. Mus. No. 2939. Lateral views of tibio-tarsus. Natural size.

locality. These specimens are well preserved and differ from those from Chimney Butte in being slaty in color instead of pale brownish white. They are strong and are heavily sculptured, showing the characters of the species fully. They measure as follows: transverse diameter through trochlea 18.9, 19.4, 21.5 mm.; antero-posterior diameter of outer condyle 18.6, 19.6, 20.0 mm.; of inner condyle 19.5, 20.0, 20.9 mm. They include extremes of dimension for this species.

Another fragment of the lower end of the tibiotarsus (Amer. Mus. 2947) was collected on July 14, 1930, in Irdin Manha beds five miles north of Arshanto Obo. This specimen, lacking the anterior portion of the inner condyle, seems identical with those listed above.

A small series of additional bones was obtained at various times in Irdin Manha deposits south and southwest of Iren Dabasu. Near Camp Margetts, 25 miles southwest of Iren Dabasu, there was obtained in 1930 the shaft of a metatarsus (Amer. Mus. 2948), much weathered, that offers no characters of note. A further lot (Amer. Mus. 2946) obtained at this same point in 1930 includes a complete metatarsus, the distal end of another, the lower end of a tibiotarsus and a first phalanx from the second digit of the wing. The complete metatarsus probably comes from an immature individual, since, though it is fully formed, the shaft appears slightly porous as is usual in young specimens. The bone has attained its full size in spite of its apparent immaturity, and is peculiar for its small dimensions, as the following measurements indicate: total length 21.3 mm.; transverse diameter of head 20.0 mm.; smallest transverse diameter of shaft 7.3 mm.; transverse diameter through trochlea 19.4 mm.; transverse diameter of middle trochlea 7.7 mm.; of inner trochlea 4.7 mm.; of outer trochlea 5.4 mm. The metatarsal fragment is larger. The section of tibiotarsus has no peculiarities of form but agrees with the complete metatarsus in small dimension. Measurements are as follows: least transverse diameter of shaft 10.0 mm.; transverse diameter through trochlea 17.9 mm.

Identification of the phalanx of the second digit of the wing as from *Eogrus aeola* is to some extent tentative since this is the only part from the wing that has been discovered. In general form it is suggestive of modern cranes but is somewhat smaller and appears slighter and weaker as though it came from a wing used only moderately. It has been somewhat distorted by pressure. It seems to indicate that *Eogrus* was a bird of only moderate powers of flight at best, as would be expected from the coursing habit shown in the structure of the lower limb.

Additional fragments (No. 2945) from Irdin Manha beds 25 miles southwest of Iren Dabasu, obtained in 1930, include fragments from the distal ends of a metatarsus and a tibiotarsus. The former agrees with the complete specimen (No. 2946) just described in small size. Three fragmentary bits of the lower ends of metatarsi collected in 1923, 23 miles south of Iren Dabasu in Irdin Manha beds, are too broken to give any additional information. They are darker than other specimens, being decidedly slaty in color.

With this understanding of the characters found in the material at hand, it will be of interest to consider the possible relationships of the species concerned.

Eogrus aeola, while sufficiently crane-like in the general sum of its diagnosis to be included in the Superfamily Gruoidea of the Suborder Grues, offers characters that give interesting suggestion of relationship to birds in two other of the suborders included in our present classification under the Gruiformes.

The modern *Cariama cristata* is obviously a bird of somewhat similar habit of life, and is suggestive in form of the fossil species because of its long and slender legs. Compared with *Cariama*, the metatarsus in *Eogrus aeola* has a similar conformation except that the middle trochlea in the fossil is relatively more slender and elongated. In addition, the outer trochlea is more elevated on the shaft and is relatively smaller, the sulci separating the trochlea are much deeper, and the groove on the posterior face of the shaft is much less evident. The talon in *Eogrus* is of entirely different form, being narrowed and elongated, more or less triangular in outline (being thus decidedly crane-like) instead of rectangular and like a block. The tibiotarsus of *Eogrus* has the general form of the condyles and of the anterior intercondylar fossa like those of *Cariama*. The supratendinal bridge and the tubercles for tendinal attachment on the shaft external to this bridge are, however, quite different, the bridge being narrowed, and the tubercles elevated, the latter resembling what is found in modern cranes and limpkins.

There is also found in *Eogrus* a definite indication of similarity to the bustards that is even more interesting. Comparison is made with the far eastern form of the common bustard, *Otis tarda dybowskii*. The metatarsus in *Eogrus* has the trochlea relatively more slender, the intertrochlear sulci much deeper, and the distal foramen more elevated. The talon is somewhat similar but in the fossil is reduced and elongated. Greater similarity is found in the tibiotarsus. The form of the condyles in *Eogrus* is closely similar, but the anterior condylar fossa is much deeper. The breadth and form of the supratendinal bridge also are quite similar, but in the fossil the tubercles external to the supratendinal bridge are much more developed and the internal ligamental prominence is less evident.

There are evident in *Eogrus*, therefore, characters that point toward relationship with the suborders Cariamae and Otides, connecting these two more certainly and definitely with the Grues and thus bringing into somewhat closer union three of the divergent elements at present placed in the order Gruiformes. The characters looking toward the bustards are especially interesting and valuable, as they serve to allocate a little more certainly this otherwise somewhat isolated group.

With the other suborders placed in the Gruiformes, *Eogrus* shows no closer resemblances than do other families in the superfamily Gruoidea.

With regard to the families closely related to the Gruidae, relationship with *Ecgrus* is clearly indicated. In the case of *Aramus* of the family Aramidae, resemblances and differences are so close to those already recorded for *Grus* that there is no need to detail them a second time.

In *Psophia leucoptera*, of the family Psophiidae, the upper end of the metatarsus is like that of *Eogrus* but has the talon projecting posteriorly to a greater degree, not sloping downward gradually to merge with the shaft as in the fossil. The form of the trochlea at the distal end of the bone in *Psophia* is quite different, being more like the condition found in *Cariama*. The lower end of the tibiotarsus in *Psophia* is suggestive of that of *Grus*, except that the tendinal tubercles are less developed. It offers differences from *Eogrus* like those found in *Grus*.

The Rallidae (Superfamily Ralloidea of the Suborder Grues) offer more trenchant differences, as indicated by a comparison with *Rallus longirostris*. In the tibiotarsus in *Eogrus*, the internal condyle is somewhat broader, viewed from the distal end, and the external condyle from the side is more flattened. The narrower internal condyle in *Rallus* throws the anterior intercondylar sulcus to the inner side instead of slightly toward the outer side as in *Eogrus*. The supratendinal bridge in *Rallus* is much wider, and the tubercles for tendinal attachment are only slightly developed. The metatarsus in *Rallus* in its general form resembles that of *Grus*, and so offers like differences when compared with *Eogrus*.

After due consideration of the sum of the characters of the lower limb in *Eogrus aeola*, it appears that it was a long-legged form, like the cranes and cariamas, that was specialized for running, in this exceeding the living cariama of South America. That it was a species of highly developed coursing habit is indicated especially by the reduction in size of the lateral trochlea of the metatarsus, the difference being especially noticeable when comparison is made with *Grus* and *Aramus*. The middle trochlea, on the other hand, is strong and robust, being relatively larger than in the modern cranes. It is of interest to note that the size and position of the trochlea relative to one another are very similar to what is seen in the living rheas (far removed in relationship) which are birds that are strongly developed for running, though details of form are quite different. This similarity (due to convergence in form and not to relationship) is corroborative of the statement that *Eogrus* was highly specialized for running. The assumption is warranted that *Eogrus* was a form with weakened powers of flight.

After consideration of other fossil gruids, the only one that seems to offer any similarity is *Palaeogrus princeps* Portis, described from the lower end of a tibiotarsus from the Middle Eocene of Monte Zuello in Italy. The published figure indicates that the general outline of the condyles and of the anterior intercondylar sulcus was quite similar to that of *Eogrus*. The form of the anterior face of the bone, however, appears so entirely different in the position of the tendinal attachments that the two do not seem allied.[1]

Eogrus sp.

In collections made in 1922 in the Lower Oligocene of the Ardyn Obo beds, near Ardyn Obo, Outer Mongolia, there was obtained a fragmentary bit of the lower end of a left metatarsus referable to this genus. The lateral trochlea are broken away, and the margins of the middle trochlea and of the broken end of the shaft are more or less water-worn. In size and in characters, so far as these have been preserved, the specimen agrees with *Eogrus aeola* of the Upper Eocene, being evidently closely allied to that form, if indeed it is not identical with it. The latter supposition appears quite probable, but definite assertion to that effect may not be made, due to the fragmentary condition of the specimen.

The bone is important in its indication of the type of bird in question in Oligocene deposits.

Eogrus sp.

In Tung Gur beds attributed to the Upper Miocene 40 miles southeast of Iren Dabasu, Inner Mongolia, in 1930 the lower end of a tibiotarsus (Amer. Mus. 2949) was collected that is referred without hesitation to the present genus. The bone is well preserved and shows fully the characters of the genus, being in conformation so similar to *Eogrus aeola* that no definite points of difference may be seen. In size it is small, being below the average of *E. aeola* and very slightly less than the smaller individuals of that form. It seems certain that it must represent another closely related form, but it is preferable to await description until more complete material is at hand.

The specimen has the following measurements: least transverse diameter of shaft 9.7 mm.; transverse diameter through trochlea 18.7 mm.; antero-posterior diameter of outer condyle 17.8 mm.; of inner condyle 17.7 mm.

[1]1933, Lambrecht, Handb. Palaeorn., pp. 518–520.

The genus *Eogrus* thus has an indicated range in time from the Upper Eocene to the Upper Miocene. It would appear, therefore, to have been a strongly dominant type of bird for a long period.

Superfamily **RALLOIDEA**

Family **RALLIDAE**

Telecrex grangeri, gen. et sp. nov.

TYPE:—Amer. Mus. 2942, a right femur with distal end missing. From the Irdin Manha (Ulan Shireh) formation, Upper Eocene, of Chimney Butte, Shara Murun region, Inner Mongolia. Collected in 1928 by Walter Granger.

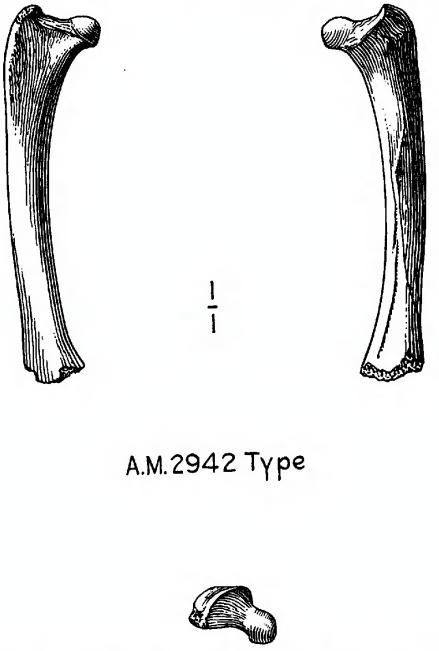

Fig. 6. *Telecrex grangeri*, gen. et sp. nov. Type, Amer. Mus. No. 2942. Anterior, posterior and end views of femur. Natural size.

CHARACTERS:—Femur differing from that of all modern rails examined in having the head compressed and flattened; trochanter reduced, with the iliac facet elongated and narrowed; distal section of shaft considerably flattened. (Fig. 6.)

DESCRIPTION OF TYPE.—Head hemispherical, somewhat flattened on anterior side, with depression for ligamentum teres relatively slight and free margin decidedly under-cut; iliac facet elongated and narrowed, the lower, inner point where the articular surface is widest, coming opposite base of neck from where the lower margin slopes abruptly into the neck and more gradually toward the trochanter, giving a narrowed

compressed outline; trochanter partly broken away; neck only slightly smaller than head; trochanteric ridge well developed (somewhat broken); obturator ridge moderately strong; two linea aspera on lower surface of shaft, beginning below head at opposite sides, converging a short distance above middle of shaft, where they nearly touch, and then diverging gradually as they proceed backward; a nutrient foramen located between the two at the point where they nearly touch; shaft relatively slender, strongly curved, having the degree of flexure usual in modern rails, much flattened toward ends, less so in center; posterior end of bone missing. Color ivory white, strongly fossilized.

MEASUREMENTS.—Transverse breadth through head 11.9 mm., transverse breadth of shaft at center 4.7 mm.

REMARKS.—The specimen on which this species is based, while fragmentary, is so distinctly ralline and at the same time so different from the large series of modern rails available that I have had no hesitance in describing it. Its principal peculiarity lies in the compressed, narrowed outline of the anterior end, which is unlike anything I have found in modern species. The curvature of the shaft, particularly the distinct downward flexure at a point past the middle toward the distal end, is similar to that found in many living rails, particularly of the subfamily Rallinae.

Apparently *Telecrex* had the habits of such modern rails as those of the genera *Rallus*, *Aramides*, and others associated with them. After due consideration of its peculiarities, it seems proper to place it in a distinct subfamily, the **Telecrecinae**, in the Rallidae. It may be considered as ancestral to the modern Rallinae, and connected more remotely with the swimming forms. It does not seem to have close relationship with other fossil rails that have been described so far as may be ascertained.

The species is named in honor of Dr. Walter Granger of The American Museum of Natural History, under whose direction the avian fossils described in the present paper were mainly assembled.

II. COLLECTIONS FROM CHINA

Order **FALCONIFORMES**

Superfamily **FALCONOIDEA**

Family **ACCIPITRIDAE**

Buteo hemilasius Temminck and Schlegel

Buteo hemilasius TEMMINCK AND SCHLEGEL, Fauna Jap., Aves, 1844, p. 16, Pl. VII (Japan).

At Yen-Ching-Kou, Wanhsien, Szechwan, in early Pleistocene deposits in pits 31 and 116, Granger obtained a metacarpus, the distal end of a tibiotarsus and part of an ulna (Nos. 2953–2954) that are identified as the present species. The specimens are strong and robust, being much larger than *Buteo buteo*. The species is found in this region to-day but has not been recorded previously from the Pleistocene.

Order **GALLIFORMES**

Suborder **GALLI**

Superfamily **PHASIANOIDEA**

Family **PHASIANIDAE**

Tragopan temminckii (Gray)

Satyra temminckii J. E. GRAY, Ill. Ind. Zool., I, 1830–32, pl. 50 (China).

A right metatarsus (No. 6340) was obtained by Granger in the pits at Yen-Ching-Kou, Wanhsien, Province of Szechwan, during the work of 1921–1922. The age is indicated by Granger as Pleistocene. While having the slender form of *Phasianus*, this differs in greater elevation of the spur core, the distance from the point of the core to the lower margin of the distal trochlea measuring 32.5 mm. In a male *Phasianus colchicus*, this distance is 18.8 mm.

Crossoptilon sp.

A left femur (No. 6329) was secured by Granger during work in 1921–1922 in the pits at Yen-Ching-Kou, Wanhsien, Szechwan, with other pheasant bones. The age is indicated by Granger as Pleistocene. The bone measures 98 mm. in length.

The eared pheasants are found to-day at high altitudes in the mountains.

Phasianus sp.

Collections made by Granger in 1921–1922 from the pits at Yen-Ching-Kou, Wanhsien, Szechwan, include two humeri, a tibiotarsus and a coracoid (Nos. 6327–6328) from pheasants of this genus. The material

is of Pleistocene age. Other collections in the same vicinity during the winters of 1921–1922, 1922–1923, and 1925–1926, in part from pits Nos. 31 and 116 (Nos. 2951–2952) in early Pleistocene deposits, include four humeri, a tibiotarsus lacking the head, and a metatarsus. *Phasianus colchicus* is a common bird in this region at the present time, and it is apparently a bird of this type that is represented in the fossil material.

Chrysolophus amherstiae (Leadbeater)

Phasianus Amherstiae LEADBEATER, Trans. Linn. Soc. London, XVI, 1828, p. 129, Pl. xv (mountains of Cochin China).

In early Pleistocene deposits in pits 31 and 116 at Yen-Ching-Kou, Wanhsien, Szechwan, Granger obtained two partial femora (No. 2955) and a tibiotarsus (No. 2956) that agree exactly in size and form with this pheasant, found commonly to-day in this part of China. It has not been recorded previously from the Pleistocene.